Claims

1. A process involving the use of an antisolvent comprising the steps of
   - feeding water to an inorganic salt source to form an aqueous solution comprising said salt,
   - feeding said aqueous solution to a crystalliser/settler,
   - contacting said aqueous solution with one or more antisolvents which force the salt to at least partly crystallise, with at least one of said antisolvents exhibiting crystal growth inhibiting properties and/or scaling inhibiting properties,

     and where if the antisolvents do not exhibit sufficient crystal growth inhibiting properties and/or sufficient scaling inhibiting properties, one or more crystal growth inhibitors are added to the antisolvents and/or to the aqueous solution, and/or one or more scaling inhibitors are added to the antisolvents and/or to the aqueous solution,
   - feeding an overflow of the crystalliser/settler comprising one or more antisolvents and an aqueous salt solution to a nanofiltration unit comprising a membrane to separate the one or more antisolvents from the aqueous salt solution,
   - removing the crystallised salt from the crystalliser/settler in an aqueous slurry,
   - optionally, recycling the one or more antisolvents to the crystalliser/-settler, and
   - optionally, recycling water from the slurry to the first dissolution step and/or to the crystalliser/settler.

2. A process according to claim 1 wherein at least part of the overflow of the crystalliser/settler is subjected to a reverse osmosis step before it is fed to the nanofiltration unit.

3. A process according to claim 2 wherein in the reverse osmosis step 10-99 wt% of water, based on the total weight of the aqueous solution comprising the salt, is removed.

4. A process according to claim 3 wherein the removed water is used as drinking or process water.

5. A process according to any one of the preceding claims which is a continuous closed loop process, wherein the aqueous salt solution which leaves the nanofiltration unit is recycled to the salt source.

6. A process according to any one of the preceding claims wherein the crystallised salt in an aqueous slurry is fed to a centrifuge, optionally after being fed to a washing leg.

7. A process according to claim 6 wherein the recycle of the centrifuge is fed to the crystalliser/settler and/or to the salt source.

8. A process according to any one of the preceding claims wherein the salt source is selected from the group consisting of a sodium chloride, sodium carbonate, and sodium sulfate source.

9. A process according to claim 8 wherein the salt source is a subterraneous sodium chloride deposit.

10. A process according to any one of the preceding claims wherein the antisolvent is selected from the group consisting of aromatic alcohols, polyvinyl alcohol, polyethylene glycol, nitrilotriacetic acid, carboxylic acids or polycarboxylic acids, phosphanates, polyphosphonates, functionalised or unfunctionalised carboxymethyl cellulose, organocomplexes of Fe(II) and Fe(III) ions, ethanol, acetone, isopropanol, quaternary ammonium

salts, cyclodextrines, polymers bearing amino groups, polymers bearing quaternary ammonium groups, polymers comprising nitrogen-containing aliphatic rings, sodium salts of polymers bearing anionic groups, and chloride salts of polymers bearing cationic groups, choline chloride, and choline chloride based ionic liquids.

11. A process according to any one of the preceding claims wherein the antisolvent comprises at least one crystal growth inhibitor selected from the group consisting of oligopeptides, polypeptides, and polymers bearing two or more carboxylic acid groups or carboxyalkyl groups and optionally also phosphate, phosphonate, phosphino, sulfate and/or sulfonate groups; functionalised or unfunctionalised monosaccharides, disaccharides, and polysaccharides; potassium ferrocyanide; lead chloride; cadmium chloride; manganese sulfate; quaternary ammonium salts; cyclodextrines; polymers bearing amino groups; polymers bearing quaternary ammonium groups; polymers comprising nitrogen-containing aliphatic rings; sodium salts of polymers bearing anionic groups; and chloride salts of polymers bearing cationic groups.

12. A process according to any one of the preceding claims wherein the antisolvent comprises a scaling inhibitor selected from the group consisting of oligopeptides, polypeptides, polymers bearing 2 or more carboxylic acid groups or ester groups, and optionally also phosphate, phosphonate, phosphino, sulfate and/or sulfonate groups, functionalised or unfunctionalised monosaccharides, disaccharides, polysaccharides, polymers with one or more alcohol groups, humic acids, surfactants from a natural source such as disproportionated rosin acid soap, lactic acid, phospholipids, a suspension of yeast cells, a suspension of algae, N,N-diethyl-1,3-diaminopropane, ethylene diamine, polyisobutylene derivatives, N,N-dimethyl-1,3-diaminopropane, diethylene triamine, triethylene tetramine, 1,6-diaminohexane, poly[oxy(methyl-1,2-

ethanediyl)], hexamethylene biguanide, maleic anhydride homopolymer, amylase, protease, sodium citrate, citric acid, N,N,N',N'-tetra-acetylethylene diamine, nonanoyloxybenzene sulfonate, polyepoxy-succinic acid, polyacrylamide, ethylenediamine tetramethylene phosphonic acid, sulfonated polyoxyethylene ethers, quaternary ammonium salts, cyclodextrines, polymers bearing amino groups, polymers bearing quaternary ammonium groups, polymers comprising nitrogen-containing aliphatic rings, sodium salts of polymers bearing anionic groups, chloride salts of polymers bearing cationic groups, fatty acids, orange juice, apple juice, polyethylene imine, sodium dimethyl dithiocarbamate, and Fe(II) or Fe(III) iron complexes with one of the above-mentioned scaling inhibitors.

13. A process according to any one of the preceding claims wherein the one or more antisolvents or the one or more crystal growth inhibitors have scale inhibiting properties.

14. A process according to any one of the preceding claims wherein a hydrophilic antisolvent is used which will take up at least 5 wt% of water, based on the total weight of the antisolvent.